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**Canadian Science Advisory Secretariat (CSAS)**

**Proceedings Series 2015/031**

**National Capital Region**

# Proceedings of a National Peer Review of Operational Advice for Fisheries Protection Program

**September 30 to October 3, 2013**
**Ottawa, ON**

**Chair: Jake Rice**
**Editor: Erika Thorleifson**

*Fisheries and Oceans Canada*
200 Kent Street
Ottawa, ON K1A 0E6

July 2015

Canada

**Foreword**

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

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## SUMMARY

These Proceedings summarize the relevant discussions and key conclusions that resulted from a Fisheries and Oceans Canada (DFO), Canadian Science Advisory Secretariat (CSAS) National Peer Review meeting to provide science advice on operational advice for the Fisheries and Oceans Canada's (DFO) Fisheries Protection Program in Ottawa, Ontario. Working papers focusing on managing residual impacts to fish and fish habitat through a decision framework, equivalencies in offsetting policies and metrics of fish productivity were presented for peer review.

The conclusions and advice resulting from this review will be given in a Science Advisory Report (SAR) providing advice to DFO Program Policy Sector for implementation of operational aspects of the Fisheries Protection Program under the revised *Fisheries Act*.

## SOMMAIRE

Le présent compte rendu résume l'essentiel des discussions et conclusions de la réunion d'examen national par les pairs du Secrétariat canadien de consultation scientifique (SCCS) de Pêches et Océans Canada (MPO) qui avait pour but de formuler un avis scientifique sur des questions opérationnelles pour le Programme de protection des pêches du MPO à Ottawa, en Ontario. Des documents de travail portant sur la gestion des incidences résiduelles sur le poisson et son habitat et reposant sur un cadre décisionnel, les équivalences dans les politiques de compensation et les paramètres de la productivité des poissons ont été présentés aux fins d'examen par les pairs.

Les conclusions et avis découlant de l'examen seront présentés sous forme d'avis scientifique destiné au secteur des Politiques relatives aux programmes du MPO pour la mise en œuvre des aspects opérationnels du Programme de protection des pêches, en vertu de la *Loi sur les pêches* révisée.

# 1. INTRODUCTION

A Fisheries and Oceans Canada (DFO) Canadian Science Advisory Secretariat (CSAS) National Peer Review meeting was held on September 30 – October 3, 2013, in Ottawa, ON. This advisory meeting was held to provide advice that will inform the operational implementation of legislative amendments to the *Fisheries Act* in 2012, particularly the consideration of serious harm to fish. In the Act, serious harm to fish is defined as the death of fish or any permanent alteration to, or destruction of, fish habitat. The Terms of Reference (TOR) for the science review (Appendix 1) were developed in response to this request for advice from DFO Program Policy Sector. There were three working papers prepared that are the basis of the three presentations described and which were made available to meeting participants prior to the meeting.

This Proceedings document captures at a high-level the discussions which transpired during this peer review process. For more detailed and precise information, the reader is advised to consult the published Science Advisory Report (SAR) (DFO 2014), which formally conveys the advice provided from this process, including all formal recommendations. In respect of the various scientific techniques and assessment methodologies, the reader is encouraged to consult the associated Research Documents (Bradford et al. 2015, Clarke and Bradford 2014, and de Kerckhove 2015), which support the SAR.

## WELCOME AND OPENING REMARKS

The Chair, Jake Rice, welcomed everyone and thanked them for coming to this Peer Review meeting. The Chair reviewed the Terms of Reference and the agenda (Appendix 2) and explained the purpose of the three day meeting, which was to provide a thorough scientific review of the information presented in the three working papers, with the intent of using this information and the expertise in the room to provide science advice on the operational measures of the Fisheries Protection Program (FPP). Participants introduced themselves (Appendix 3). Participants were encouraged to participate actively in the discussion.

# 2. PRESENTATIONS AND DISCUSSIONS

## PRESENTATION 1: SCIENCE ADVICE ON A DECISION FRAMEWORK FOR MANAGING RESIDUAL IMPACTS TO FISH AND FISH HABITAT

*Presented by M. Bradford*

In 2012, legislative amendments were made to Canada's *Fisheries Act*, including the Fisheries Protection Provisions that apply to activities or works (projects) that have the potential to adversely affect fish or fish habitat, potentially resulting in a loss of productivity of Canada's fisheries. The Fisheries Protection Program (FPP) sought advice from Science regarding approaches and methods for the evaluation of the adverse effects of projects, particularly for the initial screening of smaller projects where the information available for making regulatory decisions is limited. Risk assessment and management process are discussed, and a review of the application of DFO's 2005 Habitat Risk Management framework is presented. Recommendations are made on attributes that could be used to evaluate project impacts. The concept of equivalent adults is proposed as a common metric that permits diverse impacts to be computed in the units of fish potentially lost to the fishery, expressed as either abundance or production. It is recommended that regional benchmarks for fish abundance and production be developed to assist decision making when project-specific information is lacking.

## Discussion

Below are highlights of the discussion that occurred after Presentation 1 (Bradford et al. 2015). Most of the discussion involved how to develop and organize the decision tree, including:

- What should be the sequence of operational decisions?
- Which operational decisions are the responsibility of the proponent and which are the responsibility of DFO.
- What considerations need to be made in respect of the *Species at Risk Act?*
- What considerations need to be taken for ecologically and biologically significant areas (EBSAs)?
- Whether to use adult fish as the currency, and whether serious harm would constitute the death of one adult fish.
- How to incorporate cumulative impacts into the process and whether there is a cumulative effect from a residual from less than one adult fish death that is still greater than zero.

Other discussion points included:

- There was considerable discussion on how to organize the decision diagram for operational decisions in respect of FPP. The consensus around the use of the decision diagram was developed through the course of the meeting.
- Early on the participants agreed to be guided by the following sequence of decisions :
    - Will the impact result in serious harm?
    - Are there potential impacts?
    - Will impacts be avoided or mitigated?
- A participant explained that there was a list of potential activities under development by the Fisheries Protection Program.
- The Chair noted the problems in making case by case decisions that are based on a list. Some may be scientific decisions and some may not be. Before looking at a list, science needs to say what are the properties that constitute a pass and what are the properties that constitute definite failure, and what are the grey areas that need some thought. During the meeting some effort was put into making the grey area as small as possible.
- The Chair noted that the Department has to provide a scientific rational for how to choose a tolerance that will not lead to marked declines in a CRA fishery.
- A participant noted that it is important to understand why some species can be important in some places but not important in others.
- The Chair agreed. It is an example of where there may be policy reasons why, for example, bull trout may be of more importance in one region compared to another. If there ecological or biological reasons for placing species in one position or another, those should be clearly identified. It was recognized that there will be times when there is no reason except to adhere to policy guidance.
- A participant noted that it is important to remember that there is an assumption that the proponent is doing their work properly. The management system needs to recognize that this is an assumption.

- A participant noted that DFO never authorizes serious harm – unlike a harmful alteration, disruption or destruction (HADD) under the old system.
- A participant asked if discounting was ecologically valid. The author responded that it was valid as a tool. Permanent habitat loss is not an infinite value.
- There was consensus on three decision points.
    - Decision 1: does the proponent need to contact the Department at all? Science advice is needed for this decision point.
    - Decision 2: Yes, there will be a possibility of residual impact. The residual impacts have been evaluated and the conclusion is that they are low and trivial. The Department does not need to get involved.
    - Decision 3: The project does not have trivial impacts and the Department will be involved in the decision.
- There was a proposal to use *adult* fish as the currency for assessment.
- A participant felt that a benchmark was needed to see the differences in regional specificities and jurisdictions. With benchmarks one can compare across the country and across the act.
- A participant noted that the level of information available for use may be different with different projects. If the desire is to create criteria for serious harm, it will be easier if the currency is the same across all the different projects.
- The Chair noted that in the US adult equivalencies have been adopted as the currency.
- A participant noted that the use of adult equivalency comes from the mortality side of the equation. Under that heading it could be numbers of adults or production or biomass.
- Another participant noted that one can't tell which species will benefit from the changes to habitat. You need to know the linkages from habitat and production. You could scale the habitat projection and maybe with modeling you could do fisheries productivity.
- A participant noted that 90% of proponents were non-expert individuals or general laypersons.
- The Chair noted that even at Decision 1, there could be an argument that cumulative effects are relevant. If that is the case then advice would be needed on what ecologically makes it relevant and how to practically deal with it.
- The Chair noted that the consequences of a critical habitat decision under SARA are much more prescriptive than the decisions under FPP. It would be inappropriate to use the same tool to make that decision and that it is necessary to be clear on the questions we're asking. The level one decision could include critical habitat issues.
- There was an effort to identify projects that would require a lower level of information content in order for them to proceed. The project isn't clearly on the list but the proponent can go ahead and do it under some prescribed circumstances. What level of information is needed to support those intermediate decisions?
- There was discussion around the biological properties that should determine decision 1.
- A participant noted that residual impacts involve mitigation which would automatically mean that it is not Decision 1.

- The Chair noted that the benchmark would be that for all species that are part of a CRA fishery, any activity that either has no residual impact or so small that it has not consequences for the next generation of the population. That would be trivial or low impact. For a special class of species, like SARA species, it is not generations on this population because they cannot be harmed, harassed or killed.
- There was discussion around the axes on which serious harm is measured. In order to have a consistent program there has to be a decision on how many fish can die and still not have serious harm. How large the permanent alteration can be before there is serious harm? How much habitat can be destroyed before there is serious harm? If none is acceptable then we say the benchmark is zero. If there is a little then the ecological benchmark consistent with the policy is not zero.
- A participant stated that the target needs to be zero change in productivity over the generation time of the longest living fish, over an area the size of the fish with the largest home range.
- A participant noted that a basic question should be whether the project located in a sensitive area.
- The Chair noted that the technical job of coming up with currencies is easier than knowing what to do with those currencies. It will be easy to talk about different units but is harder to say from an ecological perspective what level will exceed the tolerance of the system.
- The Chair noted the difficulty in converging on a single statement but proposed two boundary condition statements. One boundary condition is the number of dead fish and the amount of habitat permanently destructed that would lead to the loss of one female spawner. You could kill 50 or 60 juvenile fish but not one adult fecund female. The other boundary is the lambda in the expected population trajectory. If you lose enough habitat that the lambda falls below 1. Those are the two boundary conditions.
- The Chair noted that the term offset is only used for decision 3. The only difference between decisions 1 and 2 is that decision 2 involves expert participation, whether DFO or someone else, and it is designing a particular combination of activities. The activities the proponent wants to do and is willing to do to ensure that an project doesn't have an impact on the local population level. Decision 1 would include projects that are on a list of activities with guidance.
- There was some discussion on how to incorporate cumulative effects.
- There was discussion around cumulative effects and whether the degree to how perturbed the system is can fit into the box of background conditions. The discussion included whether the residual impacts are relevant to the second decision point and if cumulative effects and past uses should be a necessary decision at that point.
- A participant noted that the way that we defined the benchmark would handle the problem of cumulative effects. If there is no net loss, there won't be any cumulative effects.
- The Chair noted that there can be one type of impact on habitat and it can be matched by activities to improve something else so that the net effect of the population level is zero or better. It has to assume that the individual activities taken to balance increasing activity increases at the same rate. If this framework sufficiently manages the risk of

cumulative effects then habitat changes may accumulate but the improvements accumulate at the same rate.

- There was discussion on whether the risk is managed equivalently with the same management objectives regardless of the state of the habitat.
- It was agreed that if the same amount of residual impact poses a different risk to any objective at different positions along the axis, the case then the choice of mitigation measures could be different in these three areas. For the sake of simplicity, it may be decided to take the most ambitious mitigation measures to apply them everywhere. There could be a higher level of risk aversion in pristine habitat.
- It was agreed that discounting is an important part of the offsetting calculations. Discounting makes it possible to equate permanent impacts and transient impacts.
- One participant wondered why the damage currently being discounted isn't the same in perpetuity. The response was that the compensation in 10 years has less value than if it is done today.
- The Chair noted that the permission to do the activity is tied to the mitigation measures. The operational statement contains the mitigation measures. If there is some residual impact on habitat which is matched to mitigation measures, is there any discounting that goes into the matching?
- The participants agreed that discounting would not be part of activities that fall under Decisions 1 or 2. Discounting factors are relevant in the case specific analysis of Decision 3.
- There was discussion about situations where a primary species impacted by the project is different than the primary species that benefits from the mitigation. There was agreement that the fisheries management objectives would guide the choices there.
- There was discussion about serious harm and residuals
- A participant noted that the act does not say that the serious harm only applies to adults. The Chair responded that if there was any loss of reproductively competent fish, the risk of not meeting the objectives of the FPP would increase. For that reason, any loss of adult equivalency shouldn't be allowed.
- A participant noted that there could be many juveniles lost for a single adult. The Chair responded that as long as project specifics decisions are made that do not result in the loss of adult equivalency the objectives of the FPP are met. If the threshold of one adult equivalent is managed successfully, the risk will be managed successfully.

This working paper was accepted as a research document with changes that reflect the consensus on the decision framework model.

## PRESENTATION 2: A REVIEW OF EQUIVALENCY IN OFFSETTING POLICIES

*Presented by K. Clarke*

Under the Fisheries Act (2012), when a project or development activity is determined to cause serious harm to fish, the Minister shall consider whether measures and standards have been applied by a proponent to avoid, mitigate or offset serious harm to fish. Here offset refers to measures to counterbalance the impacts of the project and could be in the form of habitat replacement, enhancement or other activities designed to increase fisheries productivity.

Equivalency refers to the methods used to compute the amount of offsetting required, relative to the magnitude of the impact.

This report provides an overview of methods, approaches and considerations for equivalency calculations that are part of offset programs to maintain habitat or biodiversity. Programs for the US, Europe and other regions are summarized as is the international literature on offset and equivalency methods. Approaches for dealing with uncertainty and time delays in impacts or benefits are reviewed and illustrated with hypothetical examples. This review is intended as background information for the development of offset procedures in support of the Fisheries Protection Provisions of the *Fisheries Act* (2012).

## Discussion

Below are highlights of the discussion that occurred after Presentation 2 (Clarke and Bradford 2014). Most of the discussion involved how to develop and organize the decision tree, including:

- The most appropriate offset ratio to use for operational decisions, and
- The sources of uncertainty and error.

Other discussion points included:

- A participant noted that the ratios that can be calculated are based on an equivalency method. Based on fish community and habitat needs you can come up with one number or several numbers. It is not necessarily "like for like" in terms of offsetting.
- A participant asked if it would be possible to make an estimate of a minimum offset ratio that is not 1:1. The response was that it depends if you discount. With a discount it should be at least 2:1 and then you at least try to account for the time lag.
- The author noted that the work for this presentation did not include an exhaustive review of the literature beyond the last 5 to 10 years. The research document will include more references.
- The Chair noted that when available the preference will always be offsetting that is self-sustaining. Next year it will produce again. Of the range of ways to offset an impact, a permanent one is preferable to a temporary one. In order to adequately offset for the lifetime project you need an offsetting tool that continues to be productive into the future.
- The Chair noted that the generic user support tools that will be provided won't have information to support every reach of every river.
- The Chair noted that there is the assumption that there is good productive habitat unless it is proven otherwise.
- There was discussion about what the major types of uncertainties related to equivalencies are and what the risks are.
- A participant suggested a potential effect of measurement error. The participant also suggested the potential influences of climate change, aquatic invasive species and impact predictions. The Chair thought that these could potentially pose risks to the assessment and decision process.
- The Chair added other potential sources of process error, implementation error and uncertainty about future states of nature.

- A participant suggested offsetting project failure – it may not be implemented the way it was designed. There is no guarantee that it will work as well once it is built as it was intended.
- The Chair suggested that the risk of offsetting project failure has different aspects to it:
    - Uncertainty about impact prediction.
    - Risk of offsetting project failure.
        - Design failure.
        - Construction / implementation failure.
    - Uncertainty about the future state of productivity.
- A participant noted that sometimes more offsetting might be required if there is a high valued species or habitat.
- A participant asked if the proponent is truly responsible for climate change or for aquatic invasive species. The Chair responded that the advice may or may not conclude that this is something that they are accountable for. We may choose not to multiply our estimate to take account for that. Even without climate change, the intensity and timing of El Nino may be different than the decade before. It may be designed for some conditions but it encounters something else. The only way you can be sure that what you've done is responding the same is if you've done a "like for like" compensation (similar habitats).
- The Chair noted that the only ratio suggested was 4:1. If there is a time lag it would be another 2:1 on top of it. A ratio of 8:1 covers both possibilities. That's the one number found in the literature that's based on analysis.
- A participant noted that sometimes the habitat is designed well but fish don't come. Fish may not find or use the habitat. The Chair responded that that is part of the design. If the assumptions behind the design are wrong, that is design failure.
- There was a suggestion to change design failure to assumption failure.

This working paper was accepted as a research document with changes that reflect the consensus of the participants.

## PRESENTATION 3: A REVIEW OF METRICS OF FISHERIES PRODUCTIVITY

*Presented by D. de Kerckhove*

Amendments to the *Fisheries Act* in 2012 effectively changed the focus of promoting fisheries sustainability in Canada from managing the habitat that sustains fish populations (Fish Habitat Management Program - FHMP) to managing the ongoing productivity of fish stocks related to Commercial, Recreational or Aboriginal (CRA) fisheries (Fisheries Protection Provisions - FPP). The new and central role of fisheries productivity is clearly stated in Section 6 of the *Fisheries Act* such that the Minister must consider "the contribution of the relevant fish to the ongoing productivity of commercial, recreational or Aboriginal fisheries" when evaluating the capacity of a proposed development or activity to cause "the death of fish or any permanent alteration to, or destruction of, fish habitat". Since the amendment of the Act, the science and policy divisions of Fisheries and Oceans Canada (DFO) have been providing technical advice on the implications of the new focus on the FPP.

The topic of this review is to discuss and evaluate appropriate indicator metrics that can link the changes in the components to productivity to a qualitative or quantitative change in CRA

fisheries productivity. For a consistency of terminology within this paper, we will define "indicators" as metrics which have a direct link to CRA fisheries productivity, thus an indicator can also be a component of productivity metric. Advice from the recent drafts of the proposed FPP framework (Bradford et al. 2013, Koops et al. unpublished manuscript[1]) has suggested some desirable qualities in potential indicators.

This literature review has gained insight into the use of different metrics by other fields of fisheries research, management and biomonitoring and also in their theoretical links to "ongoing productivity of CRA fisheries". It sounds simplistic to say that any indicator can be linked to fisheries productivity given a proper set of assumptions, but this is generally true and a great strength of this field of research. The many linkages back to the intrinsic rate of population growth, carrying capacity or steepness coefficient offers flexibility to proponents to demonstrate quantitatively, if needed, how proposed alterations to habitat is expected to affect the CRA fisheries. In the great majority of cases, we would expect that proponents would measure only the indicator and reference the specific qualitative linkages proposed in this review and others. A common theme that has emerged throughout the literature review is that there is likely no "one-size-fits-all" indicator, or even set of indicators. This is not surprising as considerable effort was expended under the FHMP to find simple and ubiquitous metrics, yet it also proved challenging. A suite of indicators is likely most effective, but will also only be required for a particular size of project. Further, through the search for specific indicators we have discovered that some are already well parameterized for Canadian fish, offering reference points and relationships (often allometric) with other indicators.

## Discussion

Below are highlights of the discussion that occurred after Presentation 3 (de Kerckhove 2015). The discussion points included the following:

- A participant asked which metrics seemed the best to use. The author responded that the most standard metric is species presence/absence and catch per unit effort. That is the metric of density and biomass. These metrics are more useful because they are standard. The next more common metric are size based metrics.
- A participant noted that this might be useful for a big project but wasn't sure about smaller ones. The approach traditionally has been habitat before and habitat after. It's going to be hard to do something more complicated than that.
- The Chair asked whether it would be better to track something about the habitat or something about the resource.
- A participant asked how fishery observations could be connected to habitat changes.
- The Chair suggested examining the metrics independently. Noting the usefulness of contrasting them. Ideally there would be a lot of indicators but that is often not possible.
- A participant noted the value of having productivity indicators. They won't always be available so the habitat indicators could be used as surrogate in those situations. It can be hard to translate indicators into productivity when the focus is still on the habitat.

[1] A Review of Scientific Evidence Supporting Generic Productivity-State Response Curves. CSAS working Paper presented at the March 12-14, 2013 National Peer Review on Additional Science Guidance for Fisheries Protection Policy: Science-based Operational tools for Implementation.

- The Chair summarized that for ~80% of the projects captured in decisions 1 and 2, the *x*-axis of the productivity response curve, the state of the habitat, is easier to identify than the *y*-axis, productivity. The framework is also more able to control the *x*-axis. We're hoping that the *y*-axis is able to respond to changes in state. Possibly the relevance of the productivity indicators for the highly numerous small-scale space and time projects is limited. We could select a few illustrative watersheds and see if productivity does respond in those systems. Will productivity do what we assume it does?
- A participant noted that the small projects may just pay attention to species and body size. They further expressed that potentially over time we'll be able to say quite a lot about regional benchmarks.
- The Chair noted that the previous legislative framework had different objectives which can be an issue when looking at regional benchmarks.
- The Chair noted that when you have suites of indicators it is a weighted sum. A question is whether you take action based on the worst of the indicators? When using indicators in a decision context, if you are trying to make decisions about the state of habitat and ecosystems you need multiple indicators. The decision rule on how to combine the status of the indicators is something that needs to be planned when deciding the program.
- A participant wondered if it is appropriate to think of the indicators as an improvement to the uncertainty discussed earlier. The Chair agreed that if we have a choice of indicators to select, the ones that reduce uncertainty are strongly preferred.
- A participant noted that many studies find water temperature to be consistently important.
- A participant asked about the link between the indicators and adult equivalency. Another participant agreed that the adult equivalency can be characterized as the whole life history into one unit. You need to have an idea of how much of a species you have at different life stages.
- The discussion referenced the *Species at Risk Act* and EBSAs. The Chair noted that failure to be risk adverse in critical habitat has more consequences than other habitats.
- A participant noted that there is a distinction between the presence of species and critical habitat.
- The Chair noted that this gets into other management objectives. We cannot knowingly permit harassment or harm. If it is an area where the proponent is likely to encounter a species at risk, it requires a high degree of caution. The SARA habitat restrictions are stringent because of legislation but EBSAs don't have the same legislative requirements.
- A participant noted that there are some low risk projects that wouldn't be a problem for most critical habitat.
- The Chair noted that the factors that alter the feature of the habitat that make it critical habitat are supposed to be already known. If the amount of critical habitat is really limited then you might be able to be very prescriptive.

This working paper was accepted as a research document with changes that reflect the consensus of the participants.

## 3. CONCLUSION

The Chair concluded the meeting by thanking the authors for their work and for the participants for their engagement in the peer review process. The Science Advisory Report (SAR) was not completed during the meeting and was completed via email exchange afterwards. The Chair adjourned the meeting.

## REFERENCES


Bradford, M.J., Koops, M.A., Randall, R.G. 2015. Science advice on a decision framework for managing residual impacts to fish and fish habitat. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/112. v + 31 p.

Clarke, K.D., Bradford, M.J. 2014. A Review of Equivalency in Offsetting Policies. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/109. v + 18 p.

de Kerckhove, Derrick T. 2015. Promising Indicators of Fisheries Productivity for the Fisheries Protection Program Assessment Framework. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/108. vi + 69 p.

DFO. 2014. Science Advice for Managing Risk and Uncertainty in Operational Decisions of the Fisheries Protection Program. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/015.

## APPENDIX 1: TERMS OF REFERENCE

### OPERATIONAL ADVICE FOR FISHERIES PROTECTION PROGRAM

National Peer Review - National Capital Region

September 30 to October 3, 2013
Ottawa, ON

Chairperson: Dr. Jake Rice, Chief Scientist, DFO

### Context

In 2012, legislative amendments were made to the *Fisheries Act*, including new terminology and new sections to the Act. DFO's Fisheries Protection Program (FPP) seeks Science advice to inform the operational implementation of these legislative changes, particularly the consideration of serious harm to fish. In the Act, serious harm to fish is defined as the death of fish or any permanent alteration to, or destruction of, fish habitat. Proposed development projects which may result in serious harm to fish vary not only in their scale, but also in the type of potential impact. In addition, these projects occur in different fish habitat(s), potentially affecting different fish populations.

### Objectives

To better inform regulatory decisions, FPP practitioners request that DFO Science:

1. Provide advice on possible tools and approaches to inform regulatory decisions related to serious harm to fish. Such advice should consider the magnitude and likelihood of potential impacts to fish and fish habitat likely to result from development projects (works/undertakings/activities), particularly the influence of:
    a. Spatial scale,
    b. Temporal scale, and
    c. Magnitude of potential impact to fish populations.

    This advice will be guided by the peer review of a working paper on this topic.
2. Provide advice on calculating the equivalency between losses to fish and fish habitat resulting from project impacts to gains in fish and fish habitat from various types of offsetting. This advice will be derived from the peer review of a working paper on "equivalence".
3. Peer review a working paper on metrics of fisheries productivity, and provide advice on their application in the Fisheries Protection Provisions.

### Expected Publications

- Science Advisory Report
- Proceedings
- Research Document(s)

## Participation

- Fisheries and Oceans Canada (DFO) (Ecosystems and Oceans Science, and Ecosystems and Fisheries Policy and Management sectors)
- Academia or Academics
- Other invited experts

## APPENDIX 2: AGENDA

Fisheries and Oceans Canada
Canadian Science Advisory Secretariat (CSAS) National Science Advisory Workshop
CSAS National Advisory Process: Science Advice on Operational Decisions for Fisheries Protection Program

Residence Inn by Marriott Ottawa
161 Laurier Ave West, Ottawa, ON K1P 5J2
Tel: 613-231-5187
www.marriottresidenceinnottawa.com

Chairperson : Dr. Jake Rice, Chief Scientist, DFO Ecosystems and Oceans Science Sector

NB: Draft agenda. All times tentative and subject to change depending on progress.

**Monday, September 30, 2013**

| Time | Topic |
|---|---|
| 9:00 – 10:00 | • Welcome and Context (15 min.)<br>• Introduction of participants (5 min.)<br>• Review Terms of Reference (5 min.)<br>• Overview Presentation #1: Update on new developments on Fisheries Protection Program, Regulations and Policy (by Nick Winfield, Director, Program Policy. 15 min. presentation; 15 minutes questions)<br>• Overview Presentation #2: Presentation of Operational Decision-making framework (context for advice required). (by Chad Ziai, Manager, Program Coordination & External Liaison. 15 min. presentation; 15 minutes questions).<br>Approx. = 90-120 minutes |
| 10:30 – 10:45 | Break |
| 10:45 – 12:00 | Discussion and highlighted points |
| 12:00 – 1:00 | Lunch |
| 1:00 – 2:00 | Working Paper #1: Science advice on a decision framework for managing residual impacts to fish and fish habitat (Res. Doc). (M. Bradford to present)<br>• Presentation and questions<br>• Peer Review and Discussion<br>Discuss key points for Science advisory report (SAR)<br>Approx. = 90-120 minutes |
| 2:00 – 2:45 | Discussion and highlighted points |
| 2:45 – 3:00 | Break |
| 3:00 – 4:30 | • Review progress from earlier in day.<br>• Discussion<br>• Distill Science advice for managers.<br>Approx. = 90 minutes |

**Tuesday, October 1, 2013**

| Time | Topic |
|---|---|
| 8:30 – 10:30 | • Re-cap of day 1 (review progress) including discussion (30 minutes).<br>• Working Paper #2: A Review of Equivalency in Offsetting Policies (Res. Doc). (K. Clarke to present)<br>• Presentation and questions<br>• Peer Review and Discussion<br>• Discuss key points for Science advisory report (SAR)<br>Approx. = 90-120 minutes |
| 10:30 – 10:45 | Break |
| 10:45 – 12:00 | Discussion and highlighted points |
| 12:00 – 1:00 | Lunch |
| 1:00 – 2:30 | • Review progress from earlier in day.<br>• Discussion<br>• Distill Science advice for managers.<br>Approx. = 90 minutes |
| 2:30 – 3:00 | Break |
| 2:45 – 4:30 | Discussion and highlighted points |

**Wednesday, October 2, 2013**

| Time | Topic |
|---|---|
| 8:30 – 10:30 | • Re-cap of days 1 and 2<br>• Working Paper #3: A Review of Metrics of Fisheries Productivity (Res. Doc). (D. T. de Kerckhove to present)<br>• Presentation and questions<br>• Peer Review and Discussion<br>• Discuss key points for Science advisory report (SAR)<br>Approx. = 90 minutes |
| 10:30 – 10:45 | Break |
| 10:45 – 12:00 | • Review of objectives for provision of advice to managers.<br>• Drafting of Science Advisory Report (SAR) and guidance to managers.<br>Approx. = 90 minutes |
| 12:00 – 1:00 | Lunch |
| 1:00 – 4:00 | • Finalize drafting of Science Advisory Report (SAR)<br>• Review and endorse summary bullets of SAR<br>Approx. = 90 minutes |

**Thursday, October 3, 2013**

| Time | Topic |
|---|---|
| 8:30 – 10:30 | • Re-cap of days 1 - 3<br>• Review of objectives for provision of advice to managers.<br>• Drafting of Science Advisory Report (SAR)<br>Approx. = 90 minutes |
| 10:30 – 10:45 | Break |
| 10:45 – 12:00 | • Drafting of Science Advisory Report (SAR) and guidance to managers.<br>Approx. = 90 minutes |
| 12:00 – 1:00 | Lunch |
| 1:00 – 3:00 | • Finalize drafting of Science Advisory Report (SAR)<br>• Review and endorse summary bullets of SAR<br>Approx. = 90 minutes |
| 3:00 | • Conclusion |

## APPENDIX 3: LIST OF PARTICIPANTS

| Name | Affiliation |
|---|---|
| Jake Rice, Chairperson | Science, NHQ |
| Roger Wysocki, Coordinator | Science, NHQ |
| Keith Clarke | Science, NF&L |
| Doug Watkinson | Science, C&A |
| Marten Koops | Science, C&A |
| Robert Randall | Science, C&A |
| Mike Bradford | Science, Pacific |
| Susan Doka | Science, C&A |
| Melisa Wong | Science, Maritimes |
| Daniel Boisclair | University of Montreal |
| Rob McLaughlin | University of Guelph |
| Roland Cormier | DFO Gulf Region |
| Ken Minns | DFO Science (emeritus) |
| Erika Thorleifson | Science, CSAS |
| Nicholas Winfield | Habitat Policy, NHQ |
| Bronwyn Keatley | Habitat Policy, NHQ |
| Anne Phelps | Habitat Policy, NHQ |
| Glen Hopky | Habitat Policy, NHQ |
| Kristina Makkay | SARA Policy, NHQ |
| Peter Davidson | DFO Legal |
| Guy Robichaud | FPP Operations, Gulf |
| Julie Dahl | FPP Operations, C&A |
| Dominic Boula | FPP Operations, QC |
| Jason Hwang | Habitat Operations, Pacific |
| Chad Ziai | Habitat Operations, NHQ |
| Melanie Boivin | Habitat Operations, NHQ |
| Debbie Ming | SARA, Burlington |
| Simon Nadeau | Science, NHQ |
| Derrick de Kerckhove | Consultant |
| Corina Busby | Science, NHQ |